

Claims

- [c1] A footswitch for a dental scaling tip comprising:
- a sealed footswitch housing providing a pivoting member operable by foot to engage and disengage a power switch in said footswitch housing and a potentiometer for regulating the power to an ultrasonic transducer relative to the movement of the footswitch;
 - a hydraulic solenoid energized by the power switch to open a valve for the movement of water through the footswitch housing to the dental scaling tip;
 - a cable for connecting an electrical power supply to the housing;
 - a hose for connecting to a water supply to the housing;
 - a circuit energized by the footswitch power supply to drive an oscillator for providing power in a dental scaling handpiece to an ultrasonic transducer for converting electrical energy to mechanical energy; and,
 - a conductor bundle for transmitting electrical energy and water to a remote head, said remote head providing an electrical connection to a handpiece in a standard dental scaler and a valve for the adjustment of water flow to said dental scaling handpiece.
- [c2] The footswitch of claim 1 wherein the ultrasonic transducer is a magnetostrictive stack and velocity transducer.
- [c3] The footswitch of claim 1 wherein the ultrasonic transducer is a piezoelectric crystal and velocity transducer.
- [c4] The footswitch of claim 1 wherein the remote head on said conductor bundle includes an input device for changing the frequency of the oscillator in said footswitch housing.
- [c5] The footswitch of claim 1 further comprising a light source.
- [c6] The footswitch of claim 5 wherein the light source is energized by the power switch.
- [c7] A method for performing dental scaling comprising:
- connecting the footswitch housing of claim 1 to a power supply;

connecting the footswitch housing of claim 1 to a water supply;
 connecting the remote head of claim 1 adjacent a patient to a handpiece control cable;
 depressing the footswitch to energize the circuit and engage the hydraulic solenoid;
 engaging a dental scaler and moving the footswitch to clean the teeth of a patient.

[c8]

A counterless ultrasonic dental scaler system, comprising:

an integral housing unit for placement on the floor adjacent a dental chair;
 a pivoting foot platform mounted on the housing unit operatively associated with a microswitch and a potentiometer disposed in the housing unit;
 a hydraulic solenoid disposed in the housing unit and operatively coupled to the microswitch for opening and closing a valve in the housing unit to selectively start and stop a water supply stream;
 a circuit disposed in the housing unit selectively energized and de-energized by the microswitch to drive an oscillator for providing power to an ultrasonic transducer in a dental scaler handpiece remote from the housing unit at or near a resonant frequency for ultrasonically vibrating a scaling tip coupled to the stack via a velocity transducer;
 electrical and water input conductors connected to the housing unit;
 a main cable connecting the dental scaler handpiece to the housing unit, the cable comprising an electrical conductor for transmitting the power to the stack and a water conductor for supplying water to the handpiece.

[c9]

The counterless ultrasonic dental scaler of claim 8 wherein the ultrasonic transducer is a magnetostrictive stack coupled to a velocity transducer.

[c10]

The counterless ultrasonic dental scaler of claim 8 wherein the ultrasonic transducer is a piezoelectric crystal coupled to a velocity transducer.

[c11]

The counterless ultrasonic dental scaler of claim 8 further comprising a light supply source in the housing unit energized by the microswitch and operatively

coupled via the main cable to a light emitter disposed adjacent the handpiece for illumination of the tip.

- [c12] The counterless ultrasonic dental scaler system of claim 8 further comprising a control unit attached to the main cable intermediate the housing unit and the handpiece and a fastener operatively associated with the control unit for releasably mounting the control unit to a structure within reach of a dental practitioner operating the system, the control unit including a valve in the water conductor for controlling the water supply stream.
- [c13] The counterless ultrasonic dental scaler system of claim 9 wherein the circuit includes an automatic tuning feature and the control unit is free of additional controls other than the valve.
- [c14] The counterless ultrasonic dental scaler of claim 9 further comprising a manual tune feature comprising a frequency adjustment input device associated with the controller and operatively coupled to the circuit via the main cable.
- [c15] The counterless ultrasonic dental scaler of claim 9 wherein the mounting structure is the dental chair.
- [c16] The counterless ultrasonic dental scaler of claim 9 wherein the mounting structure is the dental practitioner.
- [c17] The counterless ultrasonic dental scaler of claim 11 wherein the light supply source is fiberoptically coupled to the light emitter.